



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| | | | | |
|--|-------------|----------------------|------------------------|------------------|
| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/573,697 | 03/13/2007 | Dingyi Hong | U 016220-0 | 7117 |
| 140 | 7590 | 09/29/2009 | EXAMINER | |
| LADAS & PARRY LLP 26 WEST 61ST STREET NEW YORK, NY 10023 | | | CUTLIFF, YATE KAI RENE | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1621 | |
| | | | NOTIFICATION DATE | DELIVERY MODE |
| | | | 09/29/2009 | ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

nyuspatactions@ladas.com

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/573,697 | Applicant(s) HONG ET AL. | |
| | Examiner YATE' K. CUTLIFF | Art Unit 1621 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/3/2008 & 5/15/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13, 15-21, 23-25, 27, 28 and 30-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13, 15-21, 23-25, 27, 28 and 30-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 13, 15-21, 23-25, 27, 28 and 30-32 are pending.
Claims 1-12, 14, 22, 26 and 29 have been canceled
Claims 13, 15-21, 23-25, 27, 28 and 30-32 are rejected.

Response to Amendment

2. The amendment to claims 13, 15-21, 23 – 25, 27, 28 and 30 – 32, submitted may 15, 2009 is acknowledged and entered.

Response to Arguments

3. Applicant's arguments, see pages 7 - 9, filed November 3, 2008, with respect to the rejection(s) of claim(s) 13 - 32 under 35 U.S.C. 103(a) have been fully considered and are persuasive in view of the amendments, claim cancellations and arguments. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kwantes et al. (US 4,308,404; JP 54-019951), Taylor et al. (US 2,486,342), Hachiya et al. (US 6,277,945) and Okamoto et al. (US 5,087,767).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1621

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 13, 15-21, 23 – 25, 27, 28 and 30 – 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwantes et al. (US 4,308,404; JP 54-019951), Taylor et al. (US 2,486,342), Hachiya et al. (US 6,277,945) and Okamoto et al. (US 5,087,767).

8. The rejected claims cover, inter alia, a method for preparing bisphenol A, comprising the following steps: transferring phenol and acetone into a reaction zone charged with condensation catalyst, obtaining a stream containing bisphenol A after reaction; transferring the obtained stream containing bisphenol A into a rectification zone~ obtaining a product fraction primarily containing bisphenol A and phenol; and

Art Unit: 1621

transferring the product fraction primarily containing bisphenol A and phenol into a crystallization zone to obtain a bisphenol A product; wherein a water-depleted fraction primarily containing phenol, bisphenol A and acetone and having a water content that is controlled at a level of not greater than 2% by weight is obtained from the rectification zone, and said water-depleted fraction is cooled and returned as a cycled stream to the reaction zone.

Dependent claims 15-21, 23 – 25, 27, 28 and 30 – 32 further define the apparatus used in the process and other processing limitations.

9. Kwantes et al. discloses a process for preparing bisphenol A by reacting phenol with a carbonyl compound (i.e. acetone) in the presence of an acidic ion exchange resin in a reaction zone comprised of at least two reactors in series. (see column 1, lines 8 & 40-44). The process takes part of the effluent from at least one of the reactors and recycles it to at least the first reactor. (see column 1, lines 44 - 48). In Example 2 the effluent of the reaction of phenol and acetone in the presence of the catalyst was divided into two streams where 50% was recycled to the first reactor and the other 50% fed to the second reactor. The bisphenol A was recovered from the second reactor effluent by removal of acetone, water and part of the phenol by distillation and the remaining phenol was removed by evaporation. Based on the teaching in Example 1, the 50% of recycled effluent from the first reactor in Example 2 would consist of bisphenol A, phenol, acetone and water.

The difference between the claimed process and that of Kwantes et al. is the following: recycling a water-depleted fraction primarily containing phenol, bisphenol A

Art Unit: 1621

and acetone and a water level of not greater than 2% obtained from a rectification zone, as a cycle stream to the reaction zone; and use of crystallization to obtain the bisphenol A.

10. However, Taylor et al. discloses a process for recovery of phenol by passing a crude phenol containing substantial amounts of water to a dehydration rectification zone to recover an overhead fraction which is substantially an azeotropic mixture of water and phenol, and a bottom fraction which is substantially anhydrous crude phenol. Further, the anhydrous crude phenol is passed to a rectifying zone and separated into pure phenol. (see column 1, lines 10 – 18). The rectifying type used in Taylor may be a conventional type with packed column. (see column 3, lines 52 - 54). Additionally, Hachiya et al. discloses that a phenol rectification column can be used to purify by-product phenol recovered as crude by-product phenol from the process of making high quality aromatic polycarbonate. (see column 2, lines 37, - 64; & column 1, lines).

From the teaching of Kwantes et al. it is known in the art to recycle a portion of effluent from the into the condensation reaction between phenol, acetone in the production of bisphenol A. Further, from the disclosure of Okamoto et al. it is known in the art that the water generated, in the process for producing bisphenol A by a condensation reaction with phenol and acetone in the presence of an ion exchange resin, can reduce the activity of the catalyst. (see column 2, lines 5 - 23).

As such, it would have been obvious to one of ordinary skill in the art to modify the process of Kwantes et al. by including in the process steps a rectification zone such as suggested by the Taylor et al. to dehydrate the phenol, acetone, bisphenol A effluent

Art Unit: 1621

of Kwantes et al. As disclosed in Okamoto et al. the motivation for the combination of Kwantes and Taylor et al. would be to reduce the amount of water cycled back into the reaction stream to prevent poisoning of the catalyst which causes a slow down of the reaction and reduces acetone conversion.

Therefore, the invention as a whole was *prima facie* obvious because a person of ordinary skill in the art at the time the invention was made, would have been motivated to combine the prior art to achieve the claimed invention and that there would have been a reasonable expectation of success.

11. With regard to the use of a crystallization zone, Okamoto et al. discloses that the bisphenol A produced by the condensation reaction can be recovered by evaporation or crystallization. (see column 7, lines 12 – 15). Thus, this limitation is deemed to be obvious absent a showing of unexpected results.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill in the art might reasonably infer from the teachings. (*In re Opprecht* 12 USPQ 2d 1235, 1236 (Fed Cir. 1989); *In re Bode* 193 USPQ 12 (CCPA) 1976). In light of the forgoing discussion, the Examiner concludes that the subject matter defined by the instant claims would have been obvious within the meaning of 35USC 103(a). From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Art Unit: 1621

Art Made of Record

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 5,648,561 (Tan et al).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YATE' K. CUTLIFF whose telephone number is (571)272-9067. The examiner can normally be reached on M-TH 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel M. Sullivan can be reached on (571) 272 - 0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yaté K. Cutliff/
Patent Examiner
Group Art Unit 1621
Technology Center 1600

/SHAILENDRA - KUMAR/
Primary Examiner, Art Unit 1621